

Remarks/Arguments

The Examiner is thanked for the careful review of this application. The Applicant submits this Amendment in response to the Final Office Action, dated September 30, 2003, and the Advisory Action mailed on February 17, 2004. Claims 1-19 were previously cancelled and claims 20-38 are currently pending. Amendments were made to the claims to better define the invention and to present rejected claims in better form for consideration on appeal. The amendments do not introduce new matter.

Rejections under 35 U.S.C. § 103(a)

The Office has maintained rejection of claims 20-38 over the cited prior art. Specifically, the Office asserts that Tobben teaches a process of removing a photoresist using oxygen plasma and that Chen teaches a process of removing photoresist using oxygen plasma or dimethyl sulfoxide. Indicating that removing the photoresist using dimethyl sulfoxide is teaching of equivalence, the Office asserts that it would have been obvious to one of ordinary skill in the art to use dimethyl sulfoxide to remove the photoresist material.

It must be noted that the Office's mere suggestion that Tobben could be modified in view of Chen would not make replacing of the oxygen plasma by the DS mixture to remove photoresist material in Tobben obvious unless Tobben suggests the desirability of modifying the oxygen plasma with the DS mixture. *In re* Laskowski, 871 F.2d 115, 10 USPQ2d 1297 (CAFC 1989). Thus, as will be explained below, the combination of Tobben and Chen does not raise a *prima facie* case of obviousness against the subject matter defined in amended independent claims 20, 26, and 34 because the requisite suggestion or motivation to combine the references in the manner proposed by the Office is lacking, even if Tobben were to be modified as suggested by the Office, one of ordinary skill would not have arrived at the claimed invention; the suggested combination fails to teach or suggest all of the features defined in independent claims 20, 26, and 34; and Tobben teaches away from using oxygen plasma or the alleged equivalence (SD mixture) to be used to remove photoresist from over the low dielectric constant when the low dielectric constant is partially exposed.

At the outset, Applicants draw the Office's attention to amendments made to independent claims 20, 26, and 34. For instance, independent claim 20 has been amended to specifically recite that the opening is formed through the entire thickness of the hard mask

layer so as to expose the low dielectric constant layer. In the same manner, independent claims 20 and 34 have been amended to recite that removing the photoresist material from over the hard mask layer is performed after forming the opening through the thickness of the hard mask layer. Furthermore, independent claim 26 has been amended to specifically recite that the low dielectric constant layer is an organic low dielectric constant layer. Given the amendments to independent claims 20, 26, and 34 and at least the following reasons, the Applicant respectfully requests that 103(a) rejection of claims 20-38 be withdrawn.

Tobben uses oxygen plasma to remove the photoresist layers, as oxygen plasma is recognized as the method of choice in removing photoresist materials. However, Tobben acknowledges that oxygen plasma cannot be used to remove photoresist material from over the low constant dielectrics as in addition to removing the photoresist material, oxygen plasma will also remove the low dielectric constant layer underlying the photoresist material. To avoid any possible damages to the underlying low constant dielectric layer, Tobben teaches using a hard mask layer (that includes silicon) between the photoresist material and the low constant dielectric layer. Thus, it is respectfully submitted that Tobben teaches away from using oxygen plasma or any alleged equivalences of oxygen plasma when directly dealing with partially exposed low constant dielectric layer. See Tobben, column 1, lines 24-40.

Furthermore, if the DS mixture were to replace oxygen plasma so as to remove photoresist material in Tobben, per the equivalency theory of the Office, the DS mixture can remove the photoresist material without removing any portions of the low constant dielectric because the underlying low constant dielectric of Tobben is not exposed. Thus, even if one of ordinary skill in the art were to modify Tobben so as to use the DS mixture to remove the photoresist material, one of ordinary skill in the art would not have arrived at using the DS mixture to remove photoresist material where the low constant dielectric is partially exposed.

Additionally, the combination of Tobben in view of Chen fails to disclose all the features of the claimed invention. For instance, once the two etch processes of Tobben have been completed, the opening in Tobben does not extend through the entire thickness of the hard mask layer (i.e., the underlying dielectric layer is not exposed). As a result, in contrast to the claimed invention, Tobben does not teach removing the photoresist using the DS mixture after forming the opening through the entire thickness of the hard mask layer.

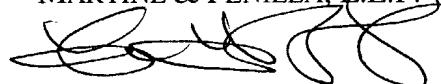
Still further, independent claim 26 specifically recites that the low dielectric constant layer is an organic low dielectric constant layer. In view of Tobben's teachings that oxygen plasma removes the underlying organic low dielectric constant if the organic low dielectric constant is not being protected by the hard mask, Tobben specifically teaches away from using the SD mixture to remove photoresist material from over the organic low constant dielectric that is partially exposed.

Accordingly, it is respectfully submitted that independent claims 20, 26, and 34 are patentable over any combination of the cited art of record. Likewise, dependent claims 21-25, 27-33, and 35-38 are also submitted to be patentable over the cited art of record for at least the same reasons discussed above. Accordingly, Applicant respectfully requests that the § 103(a) rejections be withdrawn.

In view of the foregoing, the Applicant respectfully submits that all of the pending claims 20-38 are in condition for allowance. Accordingly, a Notice of Allowance is respectfully requested. If the Examiner has any questions concerning the present Request for Reconsideration, the Examiner is kindly requested to contact the undersigned at (408) 749-6900, ext. 6913. If any fees are due in connection with filing this Request for Reconsideration, the Commissioner is also authorized to charge Deposit Account No. 50-0805 (Order No. LAM2P266).

Respectfully submitted,

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